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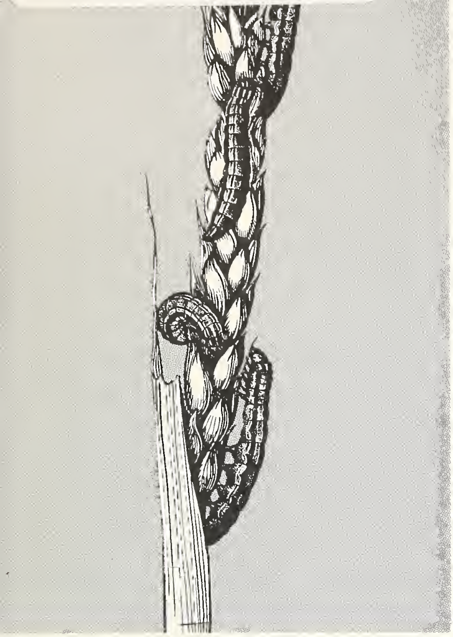
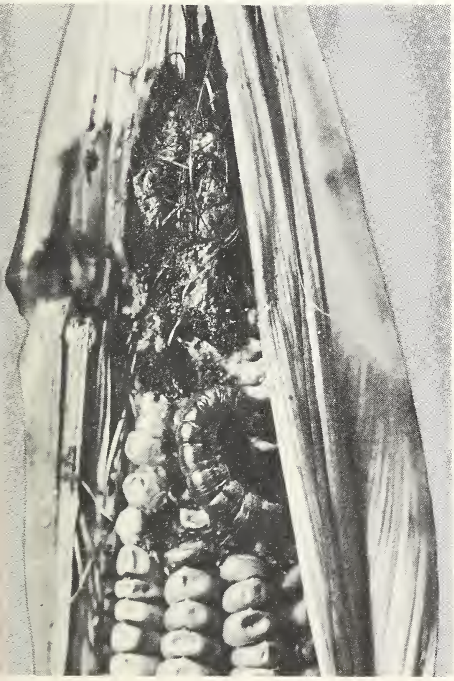




The ARMYWORM and the FALL ARMYWORM

How to control them

Leaflet No. 494

UNITED STATES DEPARTMENT OF AGRICULTURE

The ARMYWORM and the FALL ARMYWORM

. . . How to control them

The armyworm[1] and the fall armyworm[2] are closely related insects. They look alike and have many similar habits. Both insects are generally distributed over much of the United States east of the Rocky Mountains. Occasionally the armyworm occurs also in New Mexico, Arizona, and California.

The armyworm appears in early spring. The fall armyworm is so called because it does not appear in more northern parts of the country until late summer or in the fall.

These insects damage many crops, and cause losses that run into millions of dollars every year. They can be controlled with insecticides.

The Armyworm

Armyworm outbreaks have occurred in the United States since colonial times. The armyworm attacks corn, small grains, timothy, alfalfa, clover, sorghums, flax, millet, rice, sugar beets, and various grasses.

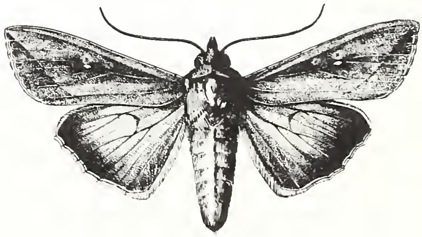
Description and habits

The fully developed parent of the armyworm is a moth, or "miller." It is brownish gray, and has a small white spot near the center of each front wing. When expanded, wings are about 1½ inches across.

After mating, female moths lay their eggs at night in folded leaves or under leaf sheaths of grains and grasses. They prefer to lay eggs in moist or shady spots, such as they find in rank vegetation along ditch banks or fence rows.

Eggs look like little white beads, and are laid in masses or rows. In 8 to 10 days they hatch into larvae.

Young larvae are pale green. They have the habit of looping



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Moth, or parent, of armyworm.

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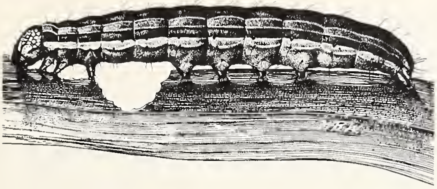
[1] *Pseudaletia unipuncta.*

[2] *Laphygma frugiperda.*



BN–11165

Full-grown larva, or caterpillar, of the armyworm.

when crawling, until they are about half grown.

Full-grown larvae are smooth, striped, and almost hairless. They are about 1½ inches long. Usually, they are greenish. They have one stripe along each side, and a broad stripe down the center of the back; stripes are dark, and often nearly black. The stripe down the back usually has a fine, light-colored, broken strip down its center. Color of the body between the dark stripes ranges from greenish brown to reddish brown. The head is greenish brown and is finely mottled with darker brown.

Larvae complete their feeding in 3 to 4 weeks. When through feeding, they burrow under litter on the ground, under clods, or 2 or 3 inches into the soil. There they make small cells, and change into pupae.

Pupae are reddish brown at first, and gradually darken until they are almost black. Then, moths emerge from the pupae.

The armyworm usually has three broods each year. It overwinters in the larval stage, or sometimes in the pupal stage. In the extreme South, all stages of the insect may be present during winter. Mild, dry winters followed by cool springs are favorable to its survival and development.

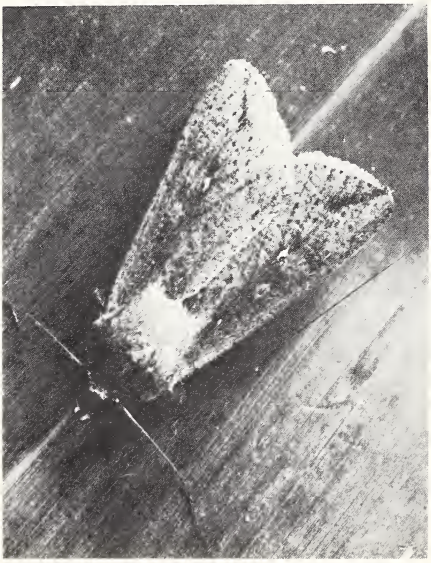
Damage

Crop damage is caused by the larvae, or caterpillars. Partly grown larvae that overwintered appear suddenly in early spring. With them are larvae newly hatched from eggs laid by moths that flew in from more southern infestations.

The larvae start feeding on vegetation. They eat leaves and immature seeds, and often devour plants down to the ground. Most serious damage is caused by nearly full-grown larvae which feed rapidly and consume large amounts of foliage in a short time.

These insects are most active at night, and may nearly destroy a crop before their presence is detected.

When armyworms have exhausted their food supply in one field, they move in hordes, like armies, to attack crops in other fields.



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Armyworm moth on corn leaf.

The Fall Armyworm

The fall armyworm has been known as an injurious pest since it was found in Georgia in 1797. Its damage usually is confined to the Southern States, but outbreaks occur in other parts of the country, and cause serious losses.

In the South, where outbreaks often follow cold, wet springs, this pest is known as the "grass worm," "overflow worm," or "southern armyworm."

It is able to overwinter only in the extreme South. The moths move northward in successive flights each summer.

The fall armyworm attacks many crops, including grasses, cereals, legumes, cotton, cabbage, and tobacco.

Description and habits

The adult is an ash-gray moth. Its forewings are mottled, and have irregular, white or light-gray spots near the extreme tip. Forewings of the female are much duller than those of the male. Hindwings of both sexes are white, and have a narrow, smoky-brown edge. When expanded, the wings are about 1½ inches across. Moths conceal themselves during the day, and become active shortly before sunset. They feed on nectar of various flowers, and live 2 or 3 weeks.

After mating, female moths lay their eggs at night on leaves of grass, on other foliage in fields, or on grass in lawns.

Eggs are light gray and partly covered, when laid, with grayish fuzz from the body of the female moth. Eggs are laid in masses of 50 to several hundred. In the South, they hatch into larvae in 2 to 4 days; in cooler areas, they may not hatch for 10 days.

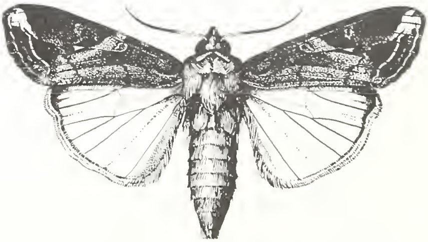
Newly hatched larvae are white, and have black heads. Their bodies darken as they feed on plants until they are full grown. During growth, they may curl up in leaf sheaths, suspend themselves from plants by threads, or move about on the ground.

Full-grown larvae are about 1½ inches long. Their color ranges from light green to almost black, and they have several light stripes along the body. Front of the head usually is marked with an inverted Y. The larvae look much like those of the armyworm, and are difficult to distinguish from them.

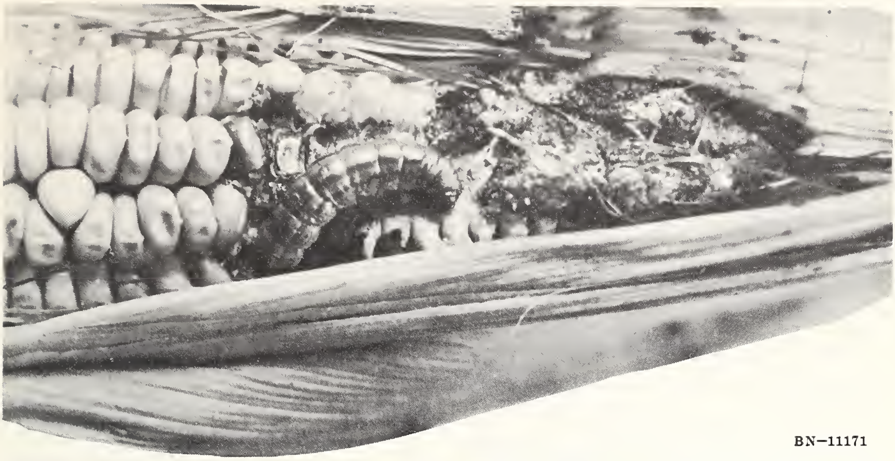
Fall armyworm larvae complete their feeding in 2 or 3 weeks. Then they burrow an inch or two into the soil, make small cells, and change into pupae.

Pupae are reddish brown at first, and gradually darken to almost black. In 10 days to 2 weeks, moths emerge from the pupae.

In the gulf States, the fall armyworm may have as many as six



Moth, or parent, of fall armyworm.



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Fall armyworm feeding on corn in the ear.

generations in a year. In the North, it has only one generation, which results from moths that migrate from the South.

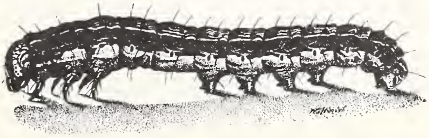
Damage

Young larvae feed on the lower surfaces of leaves, leaving the epidermis intact. At first they eat only tender parts of leaves. Later, as they grow, they devour all foliage except tough plant stems. If food becomes scarce, the worms mass together and move to nearby fields where foliage is abundant.

Larvae feed mostly at night. In sunny weather, they conceal themselves under foliage of plants. If forced by hunger to seek other food, they may migrate in the daytime. They attack and devour one another when crowded or migrating.

Fall armyworms cause different kinds of injury to different plants. Injury varies also according to age of the plants and development stage of the insects:

- In young corn, larvae eat buds and destroy plants. If plants have tasseled and ears have begun to form, they feed chiefly on tips of ears, and cut off the silks. At a still later stage, larvae bore into the sides of ears, or into the stalks. Injury to an ear of corn is similar to that caused by the corn earworm.
- Larvae attack sugarcane and sorghum in the same way they attack cornstalks.
- They injure grasses by eating off the leaves.
- They injure young cowpeas, beans, and other garden plants by cutting them off at the base, as do cutworms.
- They eat leaves of small grains, and may cut off heads by chewing through the stems.



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Full-grown larva, or caterpillar, of the fall armyworm.

Controls

Insecticides

To control the armyworm or fall armyworm, apply insecticide as a spray. Purchase it as an emulsifiable concentrate. Make your applications with either air or ground equipment.

The following insecticides are recommended:

Insecticide	*Amounts of active ingredient to apply per acre*
TO CONTROL THE ARMYWORM:	
DDT	1½ pounds
Toxaphene	1½ to 2 pounds
Parathion[1]	¼ pound
TO CONTROL THE FALL ARMYWORM:	
DDT	1 pound
Endrin	~~¾ ounce~~ 3 to 4 oz.
Toxaphene	1½ to 2 pounds
Parathion[1]	¼ pound

Cultural control

You can kill many pupae, and expose others to the weather and to their natural enemies, by a shallow cultivation of the soil after the larva have entered it.

You can reduce breeding places of the fall armyworm, and prevent serious infestation, by keeping fields free of grass.

Natural enemies

Many natural enemies attack both armyworms and fall armyworms, and help keep the populations down. Common birds including the red-winged blackbird, purple grackle, robin, crow, sparrow, and cowbird, feed on both species of armyworms.

Domestic fowl, if allowed on fields, readily devour the larvae. Toads consume many larvae, and skunks feed on larvae and pupae.

Several species of parastic flies and wasps destroy large numbers of armyworms and fall armyworms. Sometimes these parasites become numerous enough to completely control the insects in a locality.

Insect predators, such as ground beetles and soldier bugs, are important enemies of armyworms.

A fungus disease often kills many fall armyworm larvae.

BN–11174

Equal amounts of non-infested oats and oats from which armyworms have stripped the heads.

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[1] *Use parathion only under conditions where DDT, toxaphene, or endrin would leave an objectionable residue.*

Precautions

Insecticides are poisonous to man and animals. Follow directions and heed all precautions on container labels. Keep insecticides in closed, well-labeled containers in a dry place where they will not contaminate food or feed, and where children and pets cannot reach them.

If you get insecticide on your skin or clothing, remove clothing and bathe with soap and water. As soon as you have finished using insecticide, bathe and change to clean clothing.

Do not open containers in closed rooms. Do not leave metal containers of emulsifiable concentrates in the sun.

Empty containers are particularly hazardous. They should be crushed and buried.

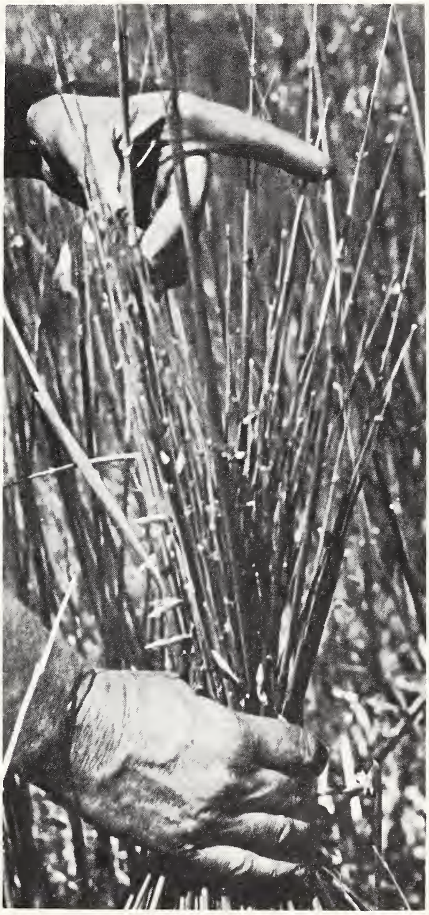
Do not apply insecticides where they can drift onto pastures being grazed by livestock.

Endrin and parathion are extremely poisonous and may be fatal if swallowed, inhaled, or absorbed through the skin. They should be applied only by a person thoroughly familar with their hazards, who will assume full responsibility for safe use, and who will comply with all the precautions on container labels.

Do not feed DDT-treated forage to dairy animals or to animals being finished for slaughter; do not apply DDT to sorghums or small grains after heads begin to form.

Application of endrin for fall armyworm control should be limited to small grains, sorghums, and corn. Make only one application of endrin per year, and do not apply it within 45 days before harvest.

Do not feed toxaphene-treated forage or ensilage made from treated plants to poultry, dairy animals or to animals being finished for slaughter; do not allow such animals to graze on treated fields. Do not treat pastures with toxa-



BN–11170

Upper part of oat plants from which armyworms have eaten the heads.

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phene more than once in a season. Do not slaughter animals within 6 weeks after removal from treated pasture.

Do not apply toxaphene to small grains more than once after heads have begun to form. Do not apply it within 7 days before harvest for oats, rye, or wheat, or within 14 days before harvest for barley or rice.

Do not apply DDT or toxaphene to cabbage after the appearance of the plant parts to be eaten.

Do not apply toxaphene to tobacco.

Do not apply parathion to cotton within 5 days; or to cabbage within 7 days; or to alfalfa, clover, grass, small grains, or sugar beets, within 15 days; or to corn within 12 days before harvest.

Do not appl bacco within 5 days before transplanting or priming, or within 15 days before cutting.

To minimize losses of honey bees and other pollinating insects, apply insecticide, when possible, during hours when these insects are not visiting the plants. Avoid drift of insecticide into bee yards and adjacent crops in bloom. Notify beekeepers at least 48 hours before spraying, so that measures can be taken to protect the bees.

To protect fish and wildlife, be careful not to contaminate streams, lakes, or ponds with insecticides. Do not clean spraying equipment or empty excess spray material near such water.

Growth Through Agricultural Progress

Prepared by
ENTOMOLOGY RESEARCH DIVISION
AGRICULTURAL RESEARCH SERVICE

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